

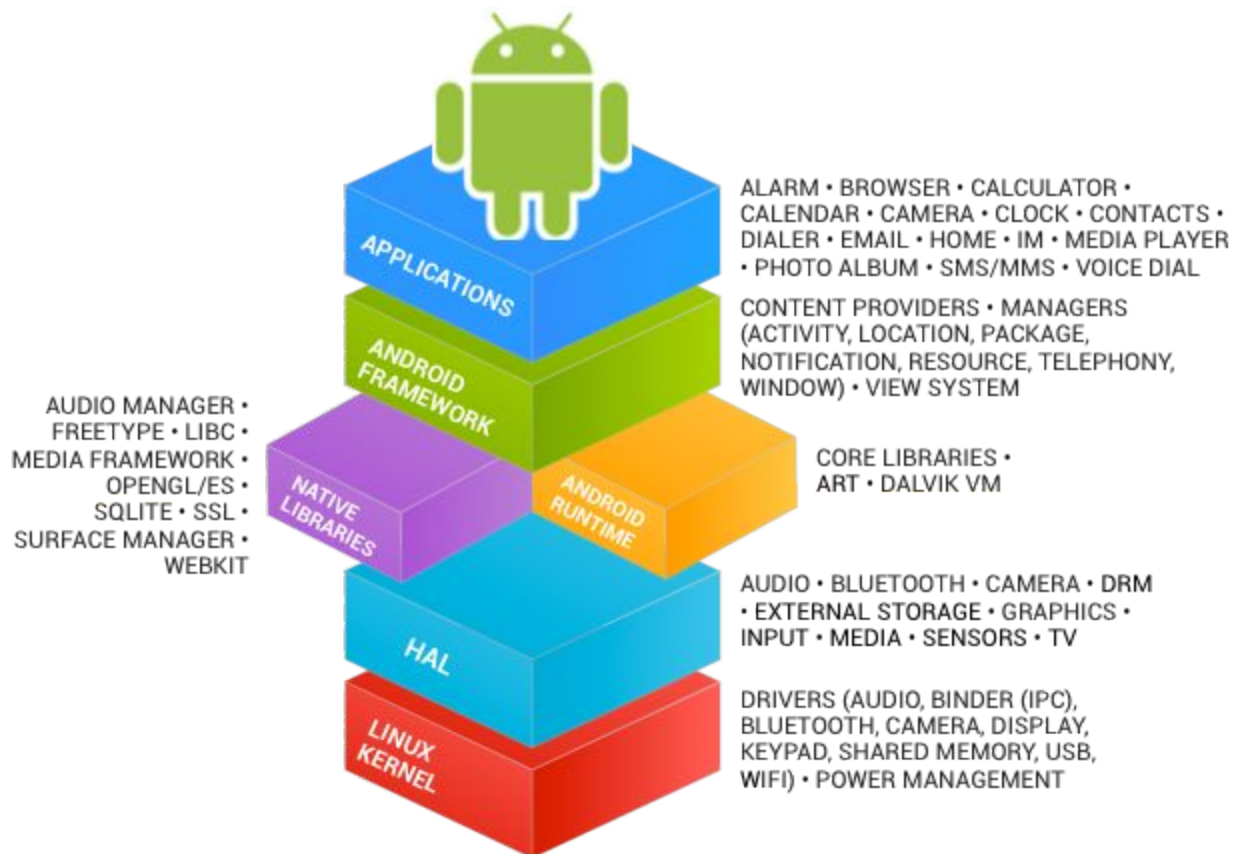


AndroidDriller

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Orientador: Leopoldo Motta Teixeira



Conceitos Básicos - Android



```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="br.ufpe.cin.avss">

    <permission android:name="br.ufpe.cin.avss.PERMISSAO_PODCAST"/>
    <uses-permission android:name="android.permission.READ_CONTACTS"/>

    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/AppTheme">

        <activity android:name="br.ufpe.cin.avss.ui.MainActivity">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
        <activity android:name="br.ufpe.cin.avss.ui.AnotherActivity" />

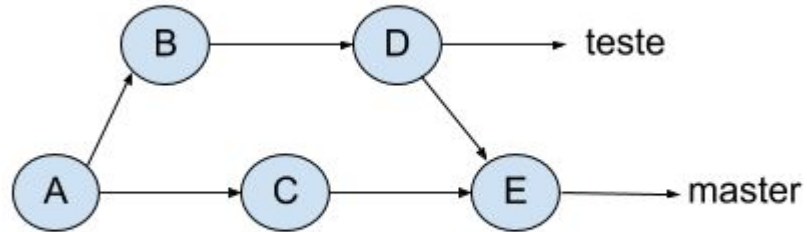
        <provider
            android:name="br.ufpe.cin.avss.db.PodcastProvider"
            android:authorities="br.ufpe.cin.avss.podcast.feed"
            android:permission="br.ufpe.cin.avss.PERMISSAO_PODCAST"
            android:enabled="true"
            android:exported="false" />

        <receiver android:name="br.ufpe.cin.avss.download.BackgroundReceiver">
            <intent-filter>
                <action android:name="android.intent.action.ON_BOOT_COMPLETE"/>
            </intent-filter>
        </receiver>

        <service android:name="br.ufpe.cin.avss.player.PodcastPlayer"/>
    </application>

</manifest>
```

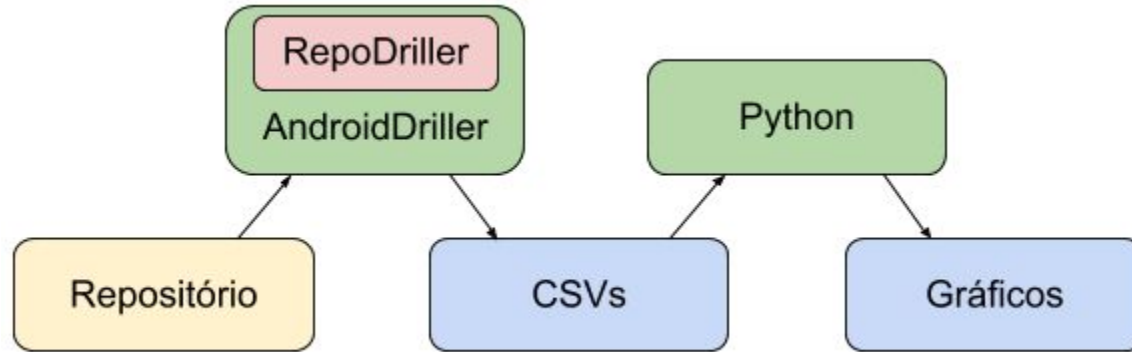
Conceitos Básicos - SCV - Git



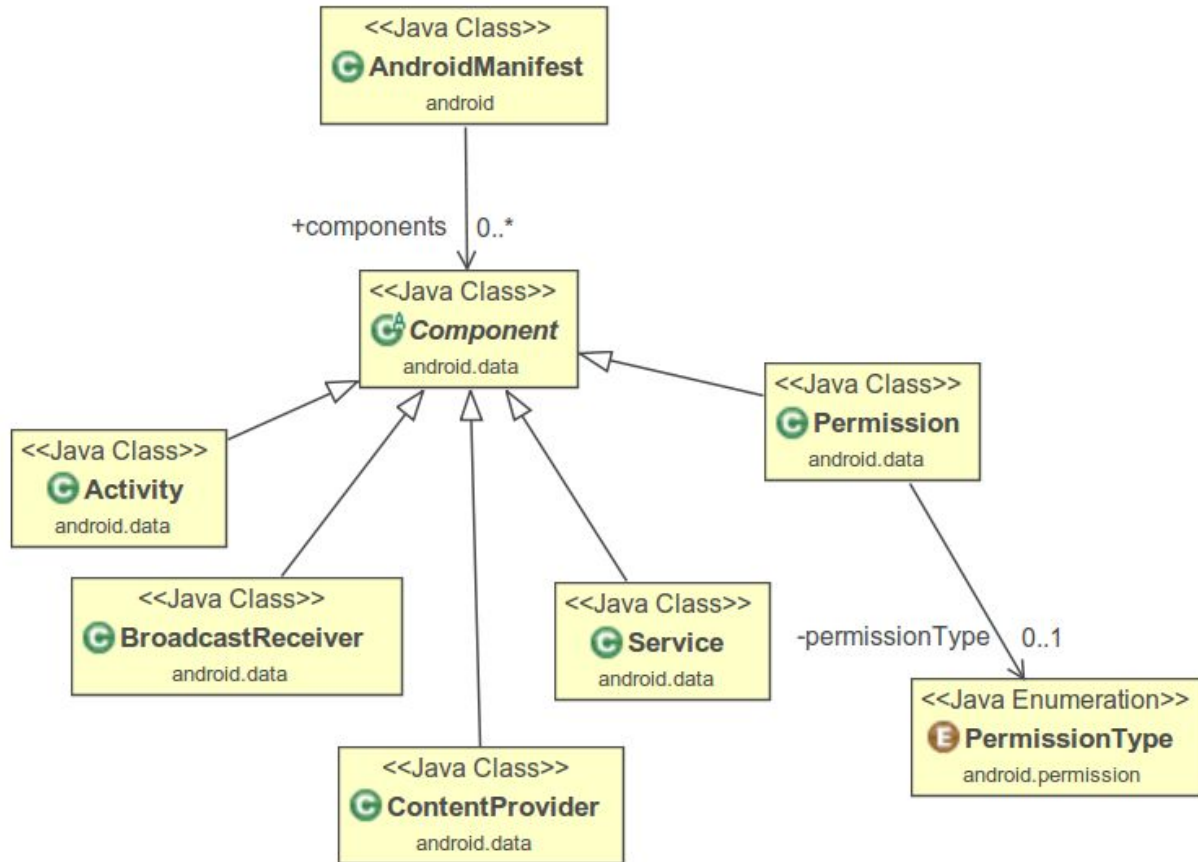
Conceitos Básicos - Mineração de Repositórios

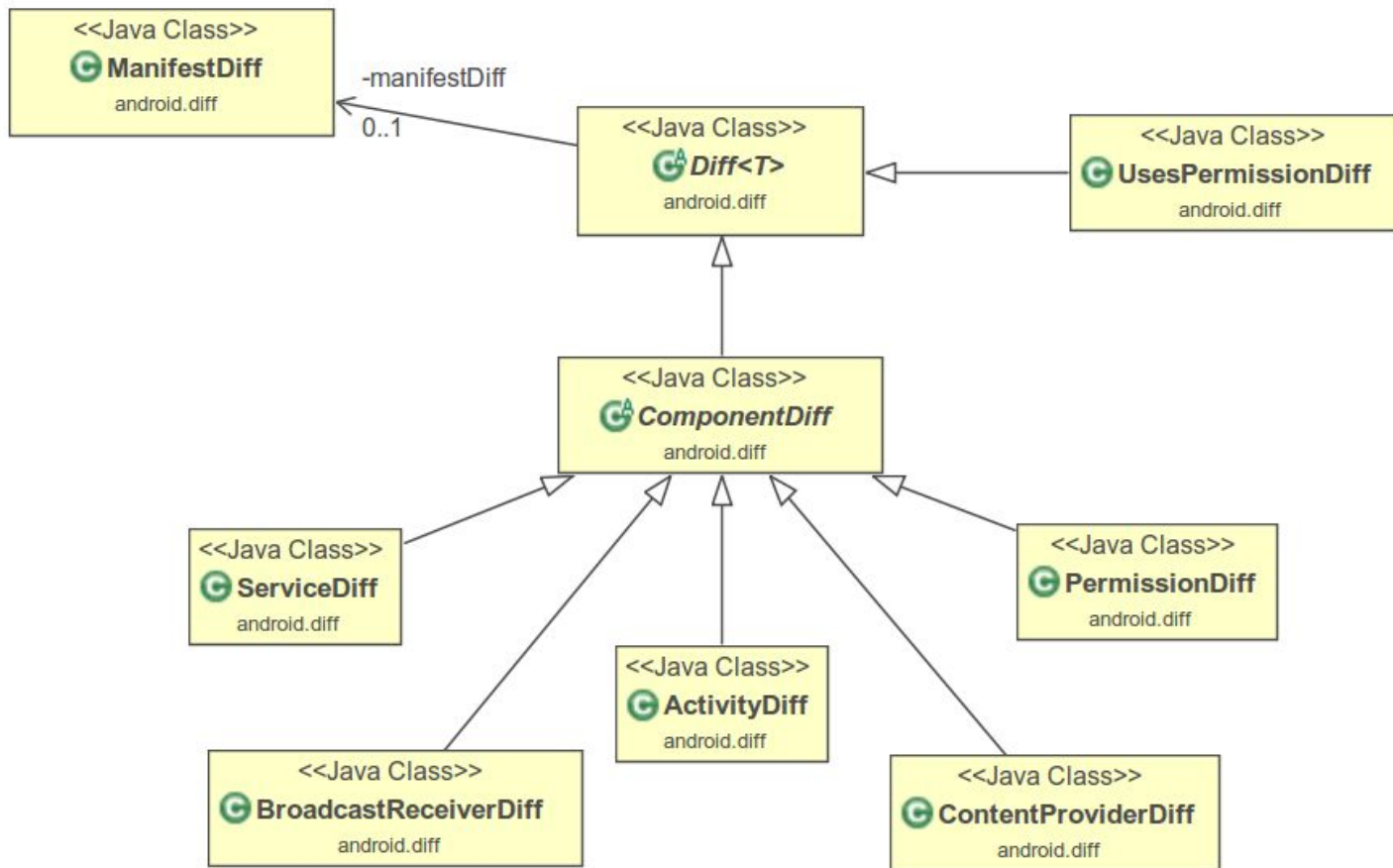
- Extração de dados
- Ferramentas
- RepoDriller

AndroidDriller - Metodologia



AndroidDriller - Implementação



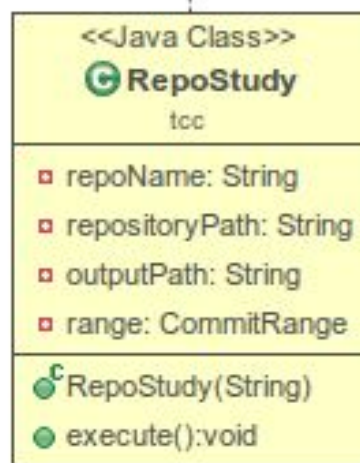


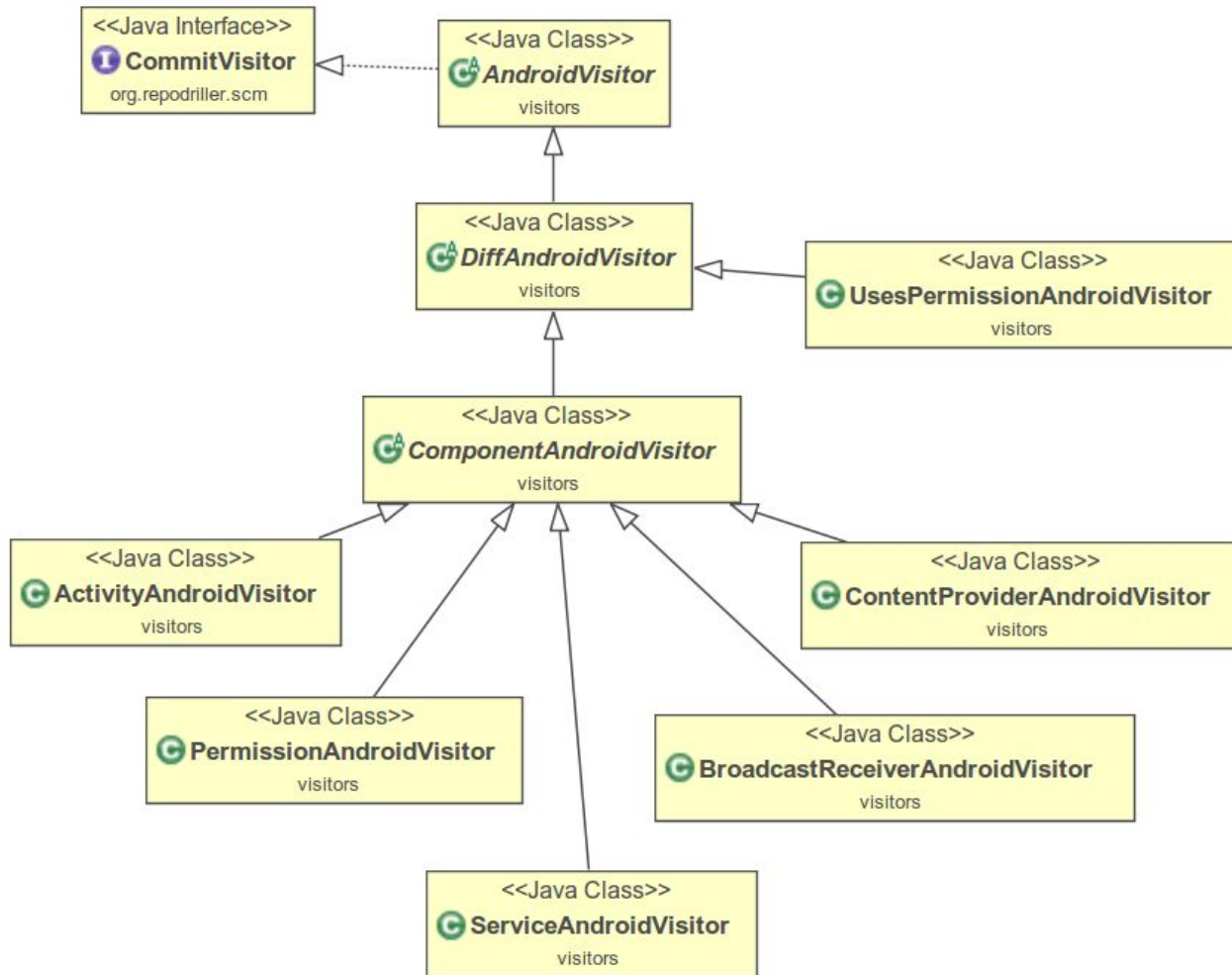
```
public class UsesPermissionDiff extends Diff<String>{

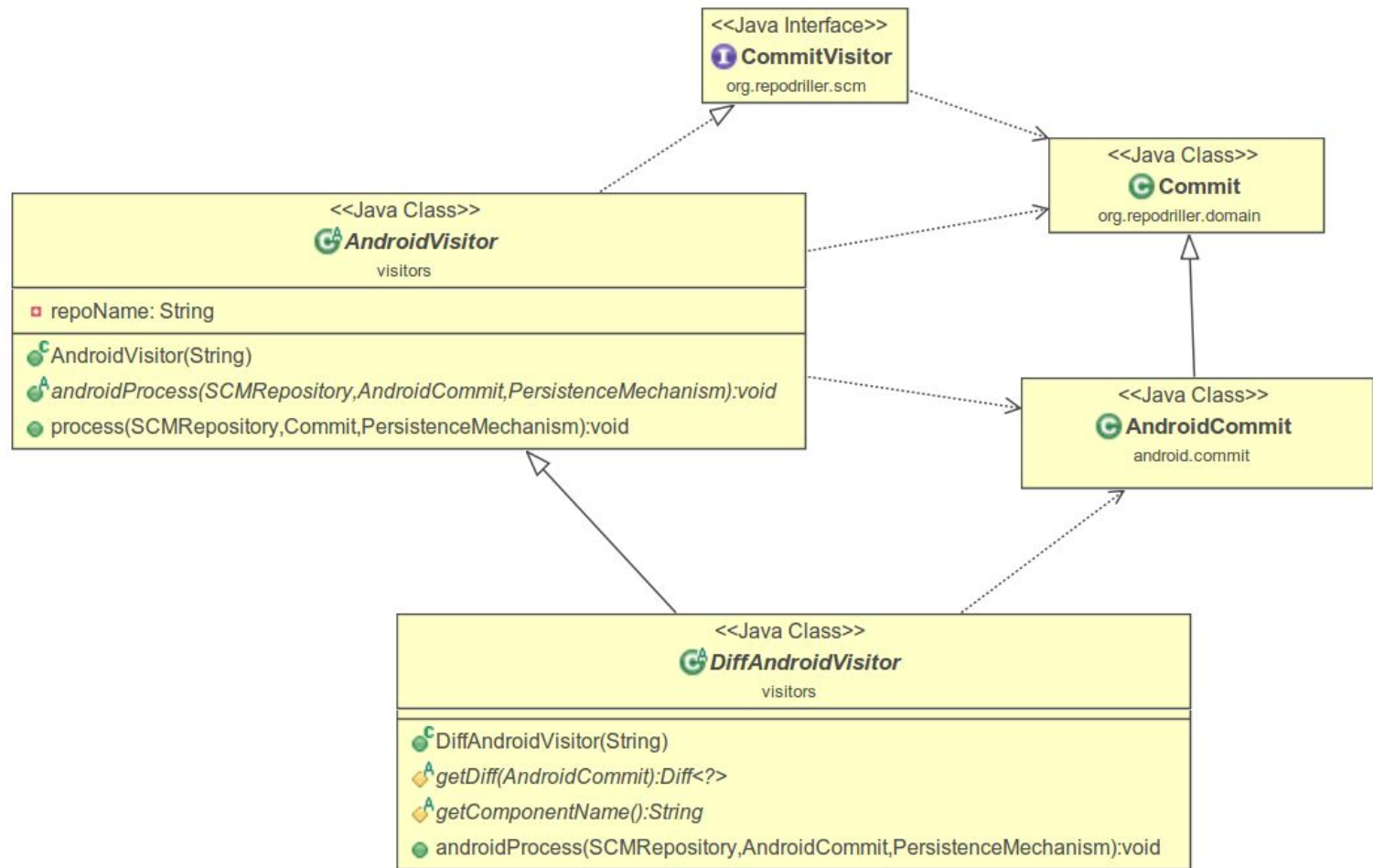
    public UsesPermissionDiff(ManifestDiff manifestDiff) {
        super(manifestDiff);
    }

    @Override
    protected List<String> getElementsList(AndroidManifest manifest) {
        return manifest.permissions;
    }

    @Override
    protected boolean isModification(String component) {
        return false;
    }
}
```







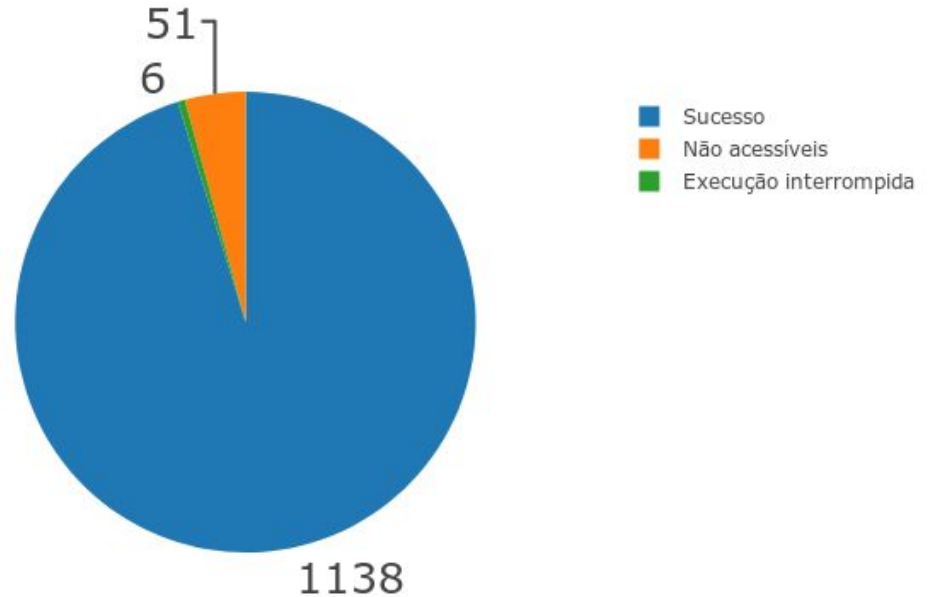
AndroidDriller - Repositórios de Teste

URL	Total	Manifesto
https://github.com/dozingcat/AsciiCam	56	28
https://github.com/uberspot/2048-android	70	21
https://github.com/naman14/Timber	597	43
https://github.com/Telegram-FOSS-Team/Telegram-FOSS	704	65
https://github.com/jackpal/Android-Terminal-Emulator.git	1088	139
https://github.com/tejado/Authorizer.git	1304	112
https://github.com/betosousa/fooAndroidManifest.git	29	24

Tabela 1: Repositórios utilizados para validação, com quantidade total de commits e commits com alteração do manifesto.

AndroidDriller - Experimento

- 1195 repositórios
- F-Droid



AndroidDriller - Resultados

Componente	Adicionados	Removidos	Modificados	Total
Activity	20024	9591	18419	6711
Broadcast Receiver	3252	1542	1025	1112
Content Provider	868	293	197	349
Service	3155	1491	724	1095
Permission	386	169	9	98
Uses Permission	7253	1289	0	4105

Tabela 2: Resumo dos dados coletados sobre os componentes.

AndroidDriller - Resultados

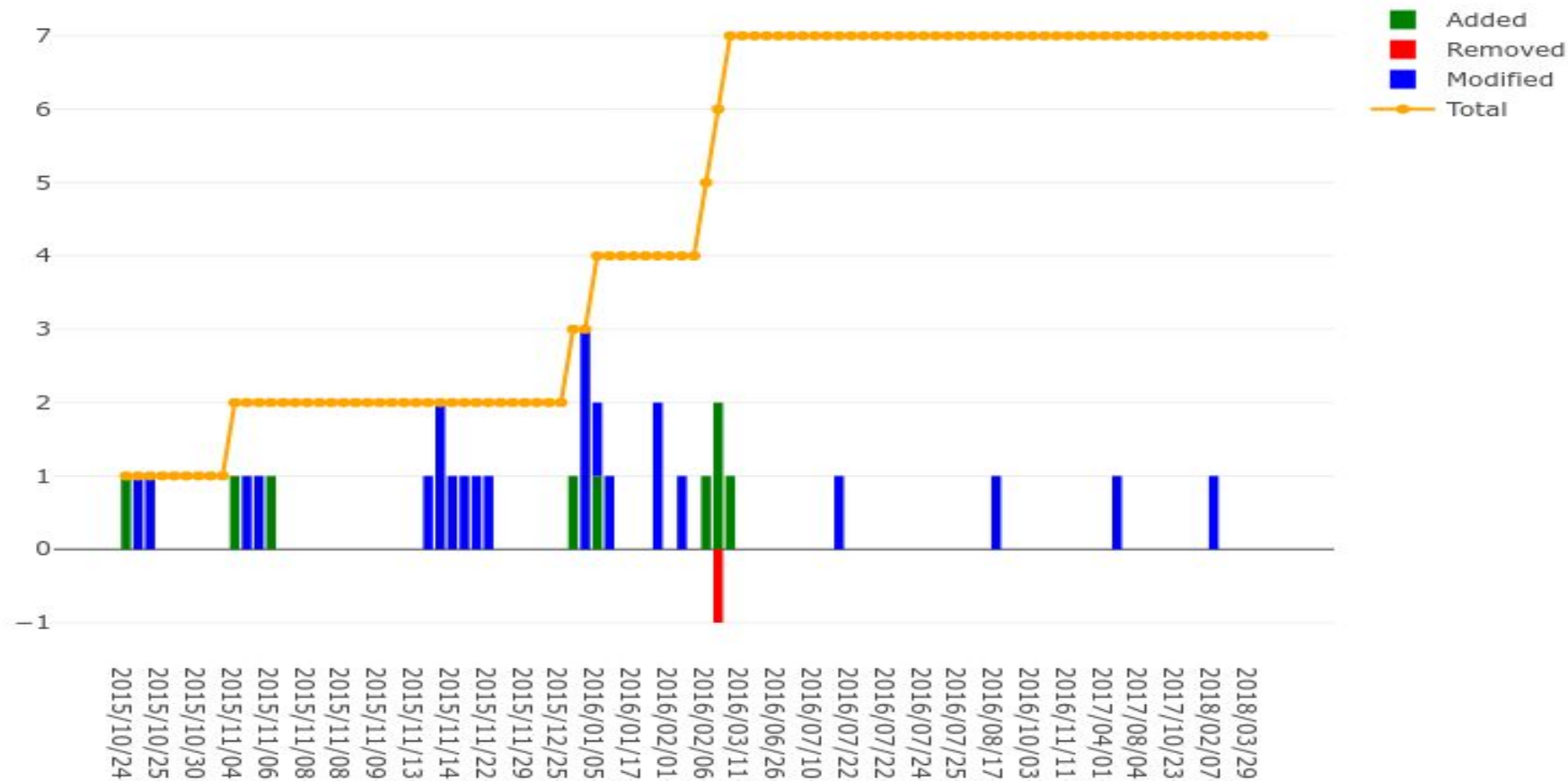
Componente	Commits	Adições	Remoções	Modificações
Activity	16803	9130	3914	7929
Broadcast Receiver	2970	2091	909	681
Content Provider	973	751	259	153
Service	3019	2251	1057	522
Permission	287	231	103	6
Uses Permission	4287	3635	770	0

Tabela 3: Resumo dos dados coletados sobre os commits por componente.

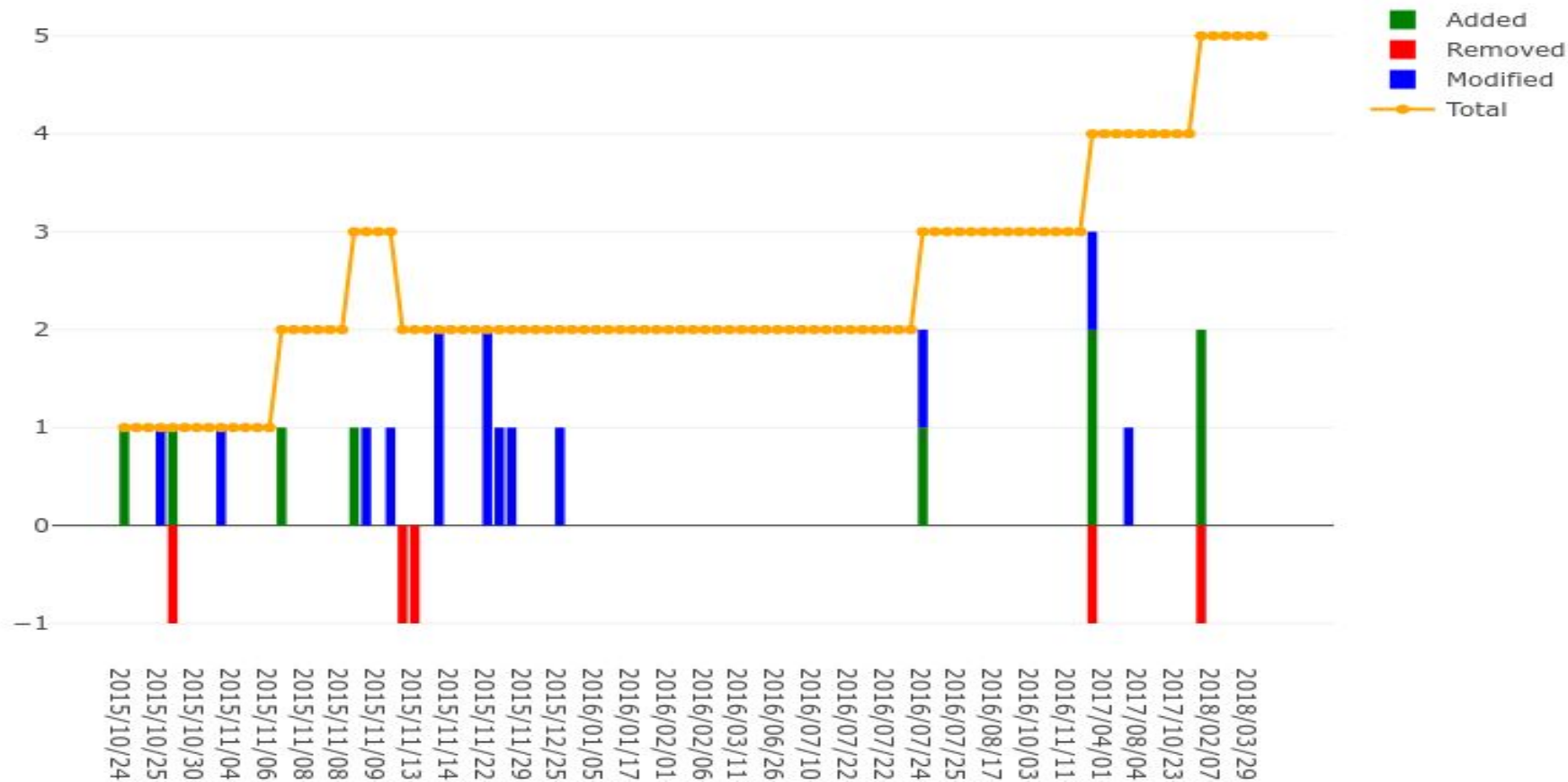
AndroidDriller - Resultados

- <https://github.com/M66B/NetGuard>
- Total de commits: 3235
- 95 commits com alterações no manifesto

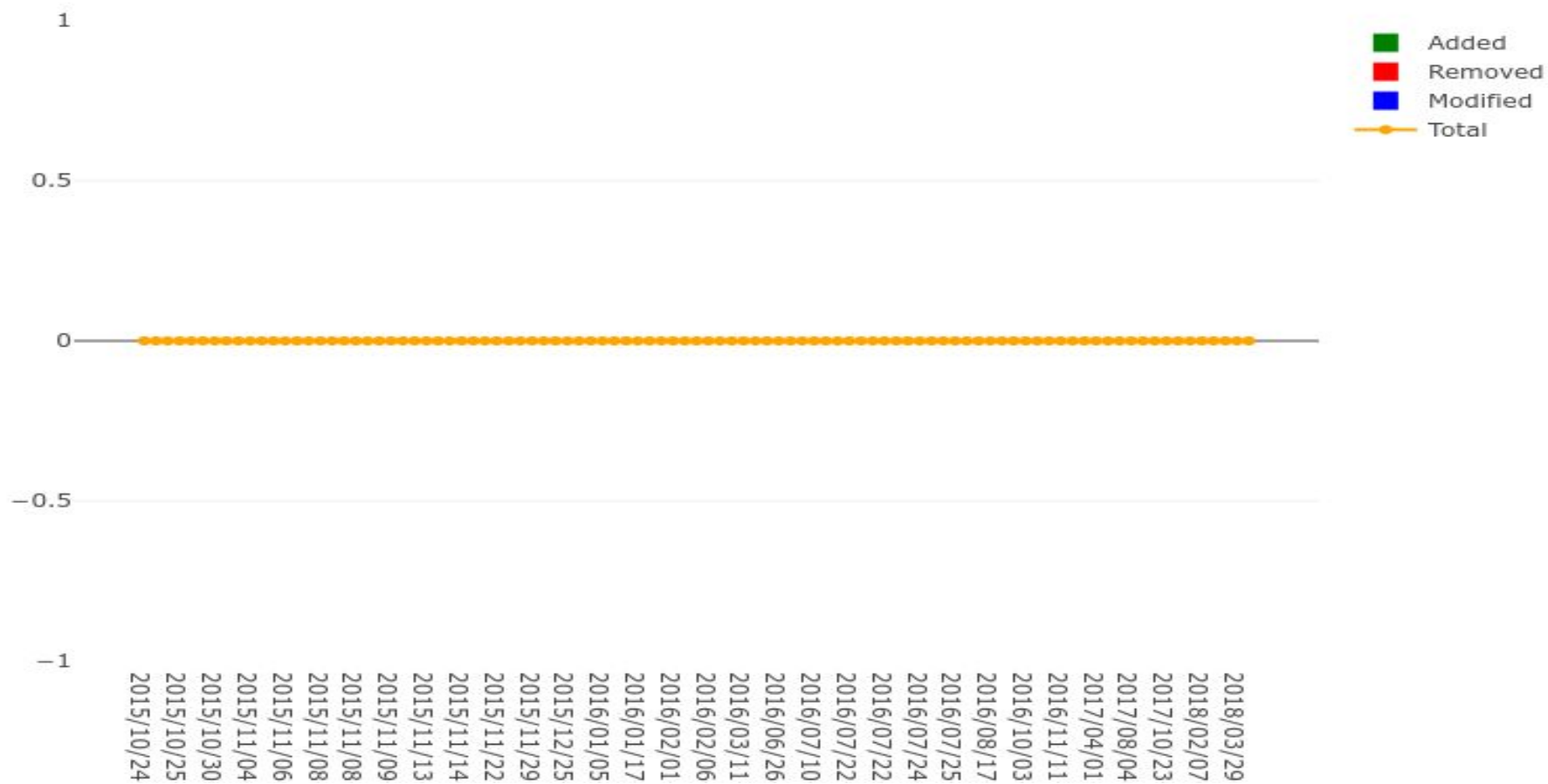
NetGuard/activity Commit History



NetGuard/broadcastReceiver Commit History



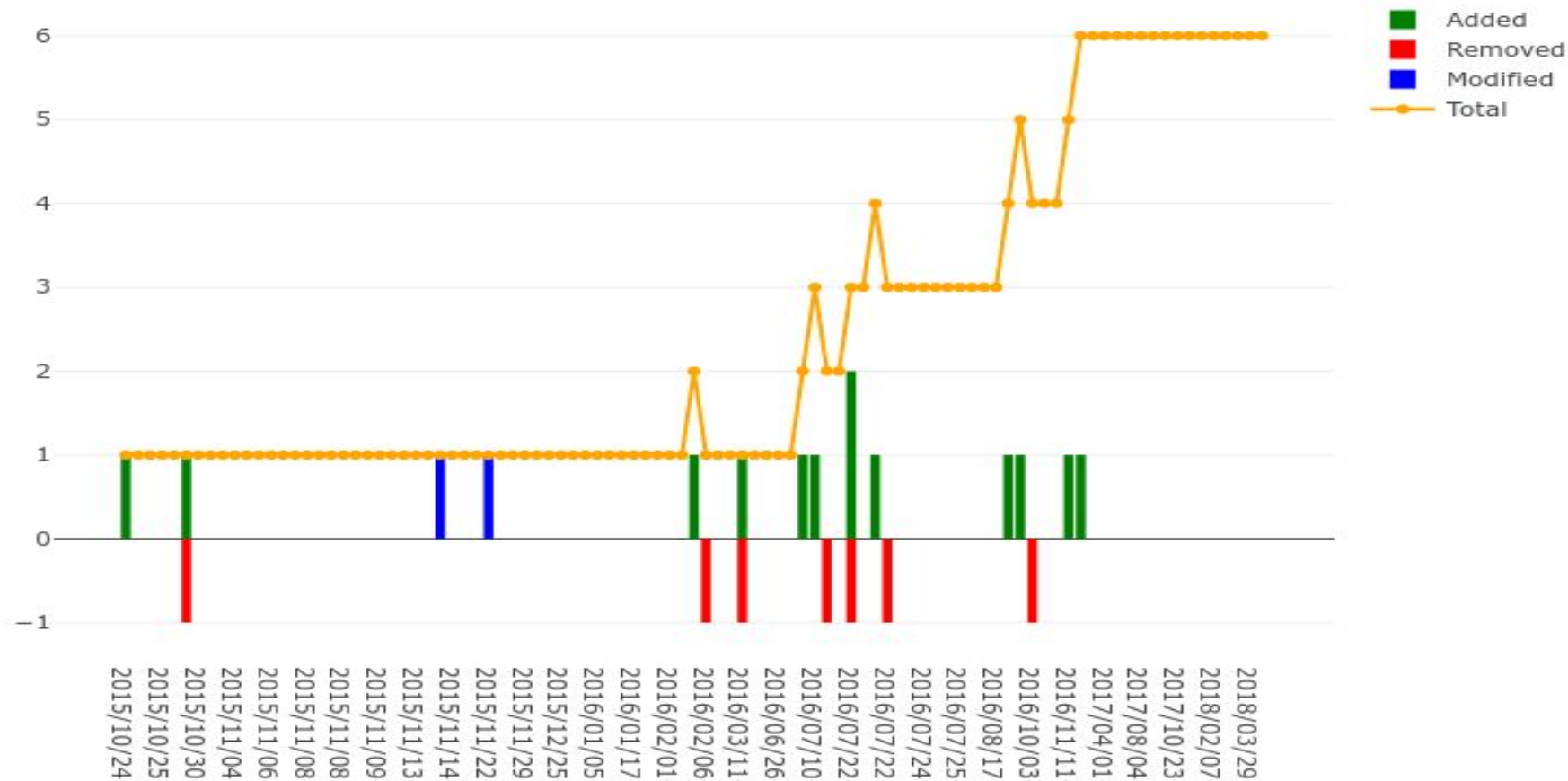
NetGuard/contentProvider Commit History



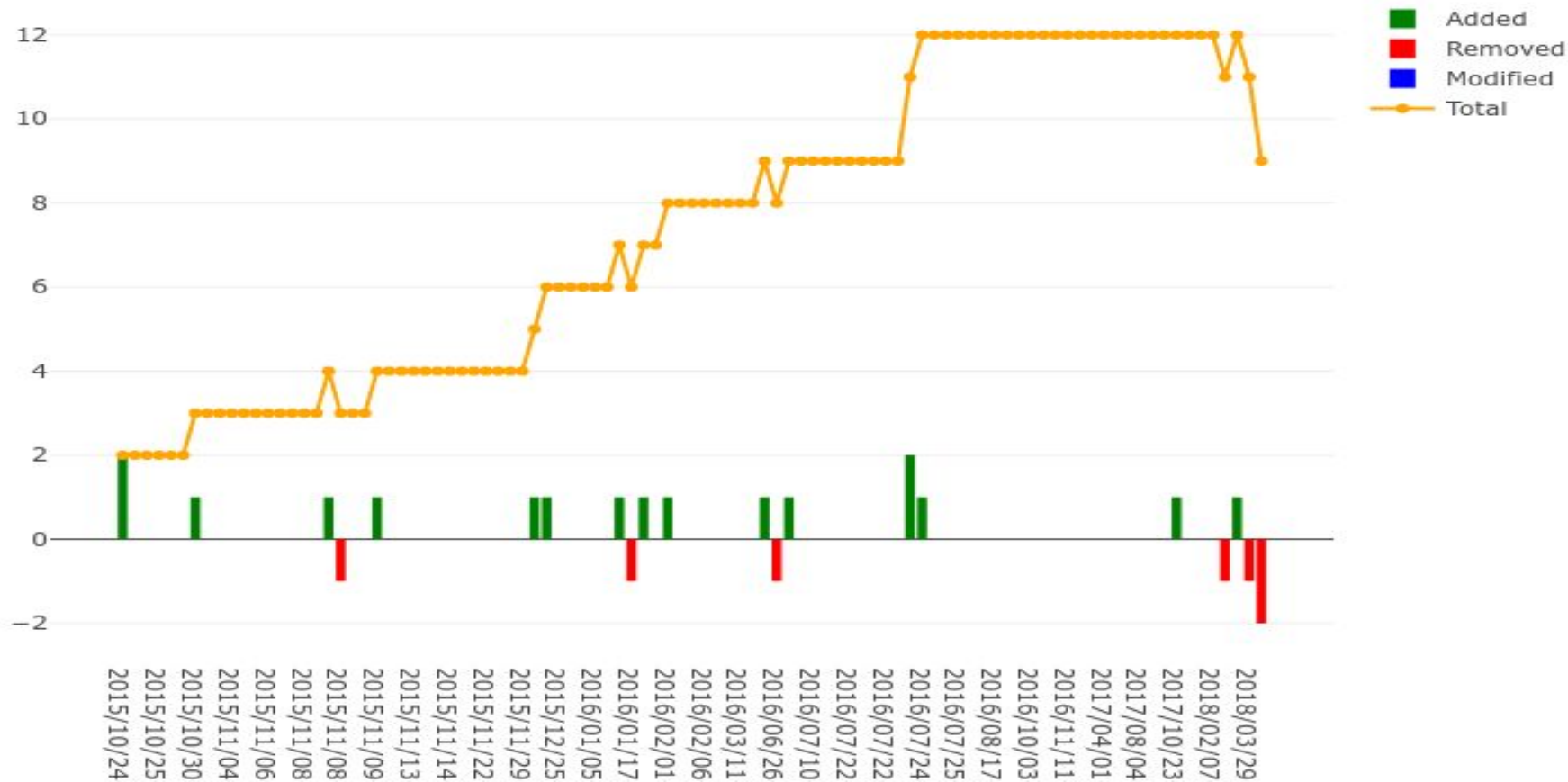
NetGuard/permission Commit History



NetGuard/service Commit History



NetGuard/usesPermission Commit History



Conclusão

- Implementação bem sucedida
- Avaliação preliminar manual
- 1138 repositórios minerados com sucesso

Conclusão - Trabalhos Futuros

- Analisar código fonte e validar junto ao manifesto
- Analisar outros elementos como AlarmManagers e AsyncTasks
- Utilizar arquivos CSV para implementar um BD.

Conclusão - Trabalhos Relacionados

- P. Calciati and A. Gorla, **“How do apps evolve in their permission requests?: A preliminary study”** in *Proceedings of the 14th International Conference on Mining Software Repositories, MSR '17*, (Piscataway, NJ, USA), pp. 37–41, IEEE Press, 2017.
- D. E. Krutz, N. Munaiah, A. Peruma, and M.W. Mkaouer, **“Who added that permission to my app?: An analysis of developer permission changes in open source android apps”** in *Proceedings of the 4th International Conference on Mobile Software Engineering and Systems, MOBILESoft '17*, (Piscataway, NJ, USA), pp. 165–169, IEEE Press, 2017
- F.-X. Geiger, I. Malavolta, L. Pascarella, F. Palomba, D. D. Nucci, I. Malavolta, and A. Bacchelli, **“A graph-based dataset of commit history of real-world android apps”** in *Proceedings of the 15th International Conference on Mining Software Repositories, MSR*, (New York, NY), p. to appear, ACM, May 2018.

Dúvidas?